

L. L. NARAYANA* & Digamber RAO*: **Contribution to the
floral anatomy of Linaceae (11)****

L. L. ナラヤナ*・D. ラオ*: アマ科の花部解剖学的研究 (11)**

Earlier publications on the floral anatomy of the family were those by Narayana (1964); Narayana and Rao (1966, 1969, 1971, 1973, 1974a, 1974b, 1975a, 1975b, 1975c, 1975d, 1976a). The present contribution deals with the floral morphology and vascular anatomy of *Indorouchera rhamnifolia* Hall. f.

Morphology of the flower The flower is bracteate, pedicellate, pentacyclic, pentamerous, heterochlamydeous, regular, bisexual and hypogynous (Figs. 1, 10, 11, 15). Bracts on the pedicel are arranged in alternating whorls, the topmost being adnate to the inner most sepal. The inner epidermal layer of a bract consists of loosely arranged clavate cells with prominent nuclei and dense cytoplasm. Tufts of glandular epidermal cells are frequently observed on the outer surface of bracts and sepals. The free sepals show quincuncial aestivation (Figs. 9-11). The polypetalous corolla shows contorted aestivation (Fig. 15). The androecium consists of ten stamens of two heights (Figs. 1, 15), the antipetalous ones being shorter (Fig. 15) and are united into a tube at the base (Figs. 11-14). The ovary is 3-carpellary, syncarpous, trilocular, with two pendulous, anatropous, bitegmic ovules in each loculus (Figs. 12-14). The free styles terminate in bilobed capitate stigmas covered by glandular hairs (Fig. 1).

Floral anatomy The pedicel shows a ring of closely arranged, discrete vascular bundles (Fig. 4). It is covered by whorls of bracts and each bract receives a trace from the stele of the pedicel (Figs. 1-3). The topmost bract adnate with the innermost sepal is vascularised by the bundles of this sepal (Fig. 10). The common sepal lateral traces and sepal midribs arise in two close alternating whorls (Fig. 5). The petal traces arise independently from the main stele (Figs. 6, 7). The bundles in the perianth divide further forming smaller bundles in the respective organs (Figs. 6-11, 15).

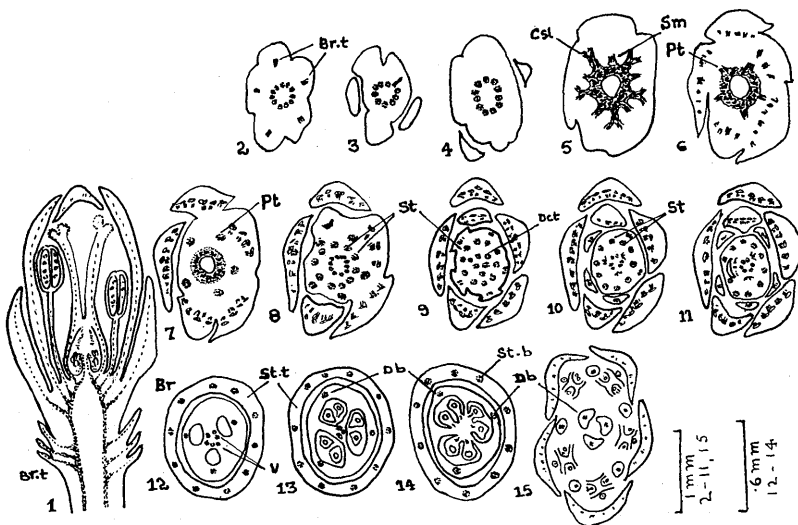
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The bundles in the sepals are capped by bands of sclerenchyma (Figs. 7-11).

The ten staminal traces arise in one whorl, as a result of condensation of the internode between the antisepalous and antipetalous whorl of stamens (Figs. 8, 9) and soon enter the base of the staminal tube (Figs. 11, 12).

After the organization of the staminal supply the main stele is organised into six bundles (Fig. 9); of these, the three that are peripherally disposed function as the dorsal carpellary traces (Figs. 9, 10). The dorsal carpellary traces trifurcate immediately after their origin and after traversing up for some distance disappear at the base of the loculi (Figs. 10-12). The remaining three bundles alternating with the dorsal bundles bifurcate into two each (Figs. 10, 11). They swing sideways and arrange in pairs opposite the loculi (Fig. 12). At a higher level, they fuse to form the ventral bundles (Fig. 13) and these constitute the ovular supply (Fig. 14). The styles are traversed by the dorsal bundles which terminate at the base of the stigmatic lobes (Figs. 1, 15).



Figs. 1-15. *Indorouchera rhamnifolia*. 1: Semidiagrammatic longitudinal section of flower showing the course of vascular bundles in the different floral parts. 2-15: Serial transverse sections of flower showing the origin and distribution of traces to the different floral parts. For explanation see text. Abbreviations. Br: bract, Br. t: bract traces, Csl: common sepal lateral traces, Sm: sepal midribs traces, Pt: petal traces, St: staminal traces, St. b: staminal bundle, St. t: staminal tube, Dct: dorsal carpellary trace, Db: dorsal bundles, V: ventrals.

Summary and conclusions The flower is bracteate, pentacyclic, pentamerous bisexual and hypogynous. Bracts are single traced; the topmost one shows adnation with innermost sepal and is vascularised by it. The sepals are three-traced. There is connation between the lateral traces of adjacent sepals. Petals are single-traced. The traces for all the ten stamens arise in one whorl. The tricarpellary, syncarpous ovary shows biovulate, three-traced carpels. The placentation is axile. While the ventral bundles are completely utilized in ovular supply, the dorsal bundles continue upto the stigmatic lobes.

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アマ科の *Indorouchera rhamnifolia* の花の構造を研究した。花は 5 輪性で各輪は 5 数性である。包葉には 1 本の維管束が入る。がく片は 3 本の維管束をもち、その側方の 2 本はそれぞれ隣りのがく片の側方維管束と接着している。花弁は 1 本の維管束をもつ。10 本の雄しべは各々 1 本の維管束をもち、一つの輪を作っている。子房は各々 3 本の維管束が走る 3 枚の心皮の癒合から作られる。子房は 3 室、中軸胎座で各室 2 個の胚珠がつく。